

TESTS OF HYBRID PINES FOR RESISTANCE TO THE  
REPRODUCTION WEEVIL UNDER FIELD CONDITIONS

A Report of Progress for the 1951 Season

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## TESTS OF HYBRID PINES FOR RESISTANCE TO THE REPRODUCTION WEEVIL UNDER FIELD CONDITIONS

In the spring of 1948 a series of three test plots were established in northern California to determine the resistance of the Jeffrey-Coulter hybrid to attack and injury by the pine reproduction weevil under field conditions. This was a three-way cooperative project between the Forest Insect Laboratory, the California Forest and Range Experiment Station and the administrative branch of the U. S. Forest Service. One plot was established in the Big Springs brushfield planting on the Lassen National Forest, where previous attack by the pine reproduction weevil had been so severe that practically none of the original planting now remains. A second plot was established in the Mt. Shasta brushfield planting where damage by the weevil has been very severe. A third planting was established in the McCloud Flats area in the vicinity of the Regional nursery of the U. S. Forest Service. Each of these plantings included 100 Jeffrey parents, 20 Coulter parents, and 100 Jeffrey-Coulter hybrids, 2-0 stock. At the end of three growing seasons the average survival from shock of planting and climatic pressure, was 71.6 percent for Jeffrey pine, 31.2, for Coulter pine, and 81.1 for the Jeffrey-Coulter hybrid. At the end of this period the average height of the planted trees was 1.34 feet for the Jeffrey pine, 2.02 feet for the Coulter pine and 1.73 feet for the Jeffrey-Coulter hybrid. During the first three years there was no mortality caused by the reproduction weevil.<sup>1/</sup>

The original program of work for this project called for the introduction of weevil-infested material into the Mt. Shasta and Big Springs test plots, after the third season, to assure a sufficient population of weevils for testing for resistance. This was done in the spring of 1951 when weevil-infested material was placed in both of these fields to approximate about a 25-percent infestation. The infested stock for the Big Springs plot came from the Institute of Forest Genetics. That for the Mt. Shasta plot came from weevil-infested material collected nearby from the original brushfield planting.

### Results of the 1951 Investigation

A check made late in September of all areas showed the following conditions in each test area.

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<sup>1/</sup> Hall, Ralph C. Tests of Hybrid Pines for Resistance to the Reproduction Weevil Under Field Conditions. Report of Progress 1948 through 1950, Forest Insect Laboratory Report. November 14, 1950

### Mt. Shasta

There was evidence of heavy feeding and attack on the Jeffrey parent and the Jeffrey-Coulter hybrid, but only limited feeding on the Coulter parent. This resulted in the killing of nine Jeffrey pine parents and only one Jeffrey-Coulter hybrid, and no killing of the Coulter parent. This is very much in line with Miller<sup>2/</sup> finding when testing these three species under nursery conditions at the Institute of Forest Genetics. In addition to the attack and injury on the plot there was also serious weevil damage in the original planting. This injury was so severe that control measures, through the aerial application of DDT at the rate of 1 pound per acre, are being planned for about 2000 acres this coming spring. As the job will be done by aircraft it will be necessary to cover the trees in the test plot at the time of spraying so that they will be available for further testing next season.

### McCloud Flats

No infested trees were placed in this area because it was adjacent to the nursery. As a result there has been no feeding or attack in this area.

### Big Springs

As was mentioned previously, the infested material for this test plot came from Placerville. This had been held in cold storage for about a month and a half prior to its introduction into the Big Springs plot. From all indications this cold storage treatment resulted in a very high weevil mortality and as a result there were very few weevils available for the test. There was very little evidence of feeding or attack by the weevils and no evidence of damage to any of the planted material. Therefore, this test was of little value during the first year.

### Plans for the 1952 Season

It is planned to repeat these tests in 1952 through the placing of additional infested material in the Mt. Shasta and the Big Springs plots. In this case the infested material will be collected locally. In the Mt. Shasta plot it will be collected from the current heavily infested material adjacent to the plot prior to the time of spraying.

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2/ Miller, J. M. Resistance of Pine Species & Hybrids to the Pine Reproduction Weevil.  
Forest Insect Laboratory Report - June, 1949

Provisions will be made to cover the trees on the test plot to protect them from spray residue. In the case of the Big Springs plot the infested material for this will be collected from the Burney Springs brushfield planting where damage from the weevil was very heavy last year.